

Additional MSU Turfgrass Research Summaries

Management Strategies to Alleviate Winterkill on Golf Courses

Dr. Kevin W. Frank, Jeff Bryan, Aaron Hathaway, and Dr. Ronald Calhoun

Winterkill of turfgrass on golf courses is a common problem in Michigan. The winter of 2009-2010 was especially devastating with the worst damage covering a stretch from west of Lansing through the northwest Detroit suburbs. Winterkill injury resulted in direct and indirect costs for golf courses as putting greens had to be reestablished with seed or sod and courses that were severely affected had decreased numbers of rounds played. Determining the best management practices to reduce winterkill has the potential to save golf courses thousands of dollars in lost golf round revenue and turfgrass reestablishment costs. This research is investigating management strategies in both the autumn prior to the on-set of winter and during the winter to determine their affect on reducing turfgrass winterkill. The research objectives are to determine the effect of autumn nitrogen, plant growth regulators, topdressing with sand, topdressing with dark colored materials, and snow removal on winterkill of *Poa annua* and creeping bentgrass putting greens.

Research was conducted in 2010-2011 on a *Poa annua* putting green and a mixed stand *Poa annua*/creeping bentgrass putting green. Crown hydration was encouraged throughout the winter months by flooding the trial area with water when air temperatures increased to 45 °F. Initial results from the winter of 2010-2011 indicate no significant winterkill of the plot areas but there were differences in spring green-up among the treatments. Research will continue in the winter of 2011-2012.

Long-Term Nutrient Fate Research

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Nitrogen fate research was initially conducted at Michigan State University in 1991. The initial research conducted from 1991 through 1993 indicated that there was minimal risk of nitrate-nitrogen leaching from turfgrass. Subsequent years of research on the same lysimeters indicate the risk of nitrogen leaching changes as the turf ages. Since the summer of 1998 percolate samples have been collected from the same monolith lysimeters and analyzed for nitrate-nitrogen. As of 2011, the turfgrass area has now been under continual fertilization practices for 21 years with percolate collection for the last 13 years consecutively. From 1998 through 2003 two nitrogen rates were analyzed: 245 kg N ha⁻¹ and 98 kg N ha⁻¹. Since 1998, NO₃-N concentrations in leachate for the low N rate have typically been below 5 mg L⁻¹. The mean NO₃-N concentration in leachate for the low N rate for the 13 years of data collection is 3 mg L⁻¹. From 2000-2002, for the high N rate, NO₃-N concentrations in leachate were often greater than 20 mg L⁻¹. In 2003 the high N rate was reduced to 198 kg N ha⁻¹ but the concentration of NO₃-N leaching from the high N rate treatment did not decline from the previous years. Since 2004, the average concentration of NO₃-N in leachate for the high N rate is 7 mg L⁻¹, which was